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Current Multilateral, Bilateral and National Financial Support for Biological Diversity Conservation*

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CURRENT MULTILATERAL, BILATERAL AND NATIONAL FINANCIAL SUPPORT FOR BIOLOGICAL DIVERSITY CONSERVATION

A Case Study

Prepared for UNEP

by

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June 1990.

I. INTRODUCTION

Terms of Reference

1.1 At the second session of the Ad Hoc Working Group of Experts on Biological Diversity held in Geneva in February of this year, several areas of basic conservation needs were identified. In order to meet these, it was argued that a new legal instrument in the form of an encompassing convention would be required. Moreover, this would have to be supported by additional international resources; because the capacity of the governments facing the most serious conservation tasks (the developing countries) to allocate domestic resources was extremely limited, and because the benefits of the conservation activities extended beyond national boundaries and were, indeed, often truly international.

1.2 To make suitable recommendations on the nature of the financial mechanisms and the legal instruments required for this purpose, the Working Group identified the need for a study to determine the real funding requirements for global conservation needs, taking into account the level of funding currently provided by development and other assistance programmes for the purpose of conserving biological diversity in developing countries. In particular, the questions to be addressed were:

a) what is the current state of expenditure on conservation of biodiversity, and what are the sources and uses of these expenditures;
(b) what are the unmet conservation needs; and
(c) how might such needs be financed, via resources external and internal to a country?

1.3 This document is concerned with answering these questions. The present section begins by describing the problem of biodiversity, explaining why it is an issue of importance and examining the actions currently being taken to address the pressing conservation concerns that face the world today. In Section II, a more precise attempt is made to

estimate the allocations of resources to developing countries for conservation and biodiversity protection. There are many difficulties in carrying out such an exercise, and what has been achieved in this report is incomplete. Nevertheless it reveals some interesting data, and these are commented upon. Section III looks at the gaps left by the current range of activities to protect the biodiversity of the planet and asks what kinds of resources might be required for each of them, as well as where such resources could come from. Section IV tries to give an initial estimate of the required funds, indicates why these estimates are only rough first orders of magnitude at this stage, and points to the areas of further effort required if more precise estimates are to be obtained. There is an annex to the report listing the agencies contacted in connection with its preparation.

The Issue of Biodiversity Protection

1.4 The concern with biological diversity encompasses all species of plants, animals and microorganisms; and the ecosystems of which they are a part. It is usually considered at three levels: genetic diversity (variety within a species), species diversity (variations within living organisms) and ecosystem diversity (variety of habitats, biotic communities and ecological processes in the biosphere). Conservation is the maintenance and continuing evolution of a species. It implies, inter alia, that a population greater than the critical minimum should be maintained if the species is to be preserved in its natural habitat (i.e. in situ).

1.5 There is no accurate estimate of the total number of different living species on this planet. Figures range from 5 to 30 million, although only 1.4 million have been properly described. Plant species, which are of particular interest in the context of this report, number about 265,000. Of these 80,000 are in temperate zones and 185,000 in tropical regions. The rate of loss of these, especially from the tropics is quite alarming. On current estimates up to 130,000 could be lost from these areas over the next quarter of a century. By contrast only 8000 species are threatened

in temperate regions. Overall the rate of loss of biodiversity is a matter of serious concern: between 5 and 30 percent of existing species are threatened with extinction over the next 20-30 years, amounting to about 100 species a day. This rate of loss exceeds the historical rate of extinction by a factor of more than 1000.

1.6 Four main reasons have been identified for this loss of biodiversity. First is habitat modification. As forests are cleared, wetlands drained, valleys flooded and roads built, so habitats are transformed and effectively lost for certain species. In forests even selective logging damages habitats for certain species. In West Malaysia, taking 3% of a certain forest is believed to have led to a loss of half the tree species[1]. There is no doubt that the extent of biological diversity is positively correlated with the habitat area. Yet the rate of loss of tropical forests is continuing so that, each minute 40 hectares of the remaining billion hectares are cleared. Second is the overexploitation of resource base. Commercial harvesting has been a threat to many marine species, exploitation has been the cause of extinction of some large terrestrial animals, and giant tortoises and well known species like the African Elephant are under threat today. One estimate has concluded that about 15% of bird extinctions and a number of tree extinctions have been caused by overexploitation[2]. Third is chemical and global pollution. Pesticides like DDT affect populations of predatory birds, lead poisoning has led to the loss of the last of the Californian Condors and acid rain has resulted in the loss of a number of fish species in Northern European lakes. In addition, global warming is now threatening many habitats. A recent report submitted to the Intergovernmental Panel on Climate Change has warned that global warming could accelerate the rate of loss of forested

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[1] A.D. Johns [1985], "Selective Logging and Wildlife Conservation in Tropical Rainforests: Problems and Recommendations", Biological Conservation, 31: 355-375.

[2] M.E. Soulé (ed.) [1986], Conservation Biology: The Science of Scarcity and Diversity, Sunderland, MA: Sinauer Associates.

areas, and another study by the World Wildlife Fund for Nature suggests that rising sea levels could threaten almost all existing wetland in the world. Finally there is the impact of introduced species. This includes the impacts of diseases that have decimated populations, such as rinderpest that reduced the population of the African Buffalo by as much as 90%.[3]

Why Biodiversity Loss Matters

1.7 The reduction of biodiversity is a matter of concern because the rate of loss results in losses of benefits and because, carefully undertaken, programmes for conservation have been shown to have a value much greater than their costs. There are a several arguments as to why the present rate of loss of species is too great.

Biodiversity as a Public Good

1.8 First, there are a number of benefits from the existence of species that cannot be captured by those who manage or exploit them or are responsible for the habitats in which they are to be found. Such values arise from the pleasure many people get from the mere existence of species, such as the African Elephant or the Blue Whale, and there is considerable evidence to suggest that the numbers involved are very large[4]. Moreover, and what is relevant in the context of this study, the benefits accrue largely to citizens of rich nations, who are willing to pay considerable sums of money just to ensure the continued existence of

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[3] S. Barrett [1988], "Economic Guidelines for the Conservation of Biological Diversity", paper presented to the IUCN General Assembly, Costa Rica.

[4] See, for example, D. Pearce and A. Markandya [1989], Environment Policy Benefits: Monetary Evaluation, OECD, Paris. Pearce has estimated that, on the basis of existence values for species and habitats in rich countries, a value for tropical forests of $8 per person in the US and N. America would be conservative. On that basis a transfer to developing countries to conserve forests would be worth $3.2 billion per annum. See D. Pearce and J. Warford, [1990], Environment and Economic Development in the Third World, forthcoming.

certain species.

1.9 Because one cannot capture this willingness to pay for species, it is not possible to ensure that such benefits are taken into account in the calculus of costs and benefits that should determine how much a species should be exploited. In economic terms this facet of biodiversity is referred to as the international or global public good aspect. The same aspect is also responsible for insufficient attention being paid to conservation for other reasons. For example, the knowledge from the future exploitation of species in the form of new drugs or better varieties of agricultural products is also a public good[5]. Although one can patent certain processes and hybrid plants, thus rendering the benefits private rather than public, one cannot patent the species themselves[6]. Finally there are the general ecological benefits to be derived from conservation of habitats, such as microclimatic effects and improvements in water and air quality. These are also public goods, which impact on the local community rather than the international one.

Uncertainty of Benefits

1.10 Future benefits of conservation are uncertain and it is well known that the greater the uncertainty, the less willing private investors will be to undertake projects in the area concerned. However, what is uncertainty to the individual is not necessarily uncertainty to society as a whole. Hence even where resources could be preserved in a private context, such as ex situ germplasm, the level of such activity will be less than socially desirable. Certainly, significant gains have been made

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[5] Such values for future use of species to develop new products are referred to as option values. Options cannot be taken out for future use of resources and therefore one argument for conservation cannot be translated into money terms. This means that public support for conservation may be justified.

[6] See G. Brown Jr. [1985], "Valuation of Genetic Resources", mimeo., and W. Harrington and A.C. Fisher, [1982], "Endangered Species", in P.R. Portney (ed.) Current Issues in Natural Resource Policy, Resources for the Future, Washington DC, pp. 117-148.

from conservation activities in the past. It is estimated that about half the increase in productivity in agricultural yields in the US can be attributed to the use of plant genetic resources in breeding programs and many important drugs, such as the two most powerful anti-cancer drugs have been found in the biological resources of tropical forests. Again it is noteworthy that many of the benefits from this exploitation of species diversity comes to the developed countries.

Common Property

1.11 Many of the public good aspects of biodiversity are closely related to their common property feature. When there are no ownership rights, and when systems of common management and ownership break down, the incentives for continued maintenance are lost and even continued flow of private benefits is not guaranteed.

Government Policy

1.12 Finally government policy is as often as anything responsible for too rapid a rate of loss of biodiversity. Although markets do not function to protect biodiversity perfectly, they would, in some cases, do better if they were actually allowed to function. It is often because of distorting government incentives that forest clearance takes place. The usual form of such incentives is via tax credits for clearance that can be offset against income tax and subsidised credits for livestock farming. As a result of these, the commercial benefits of conservation cannot compete against clearance. It should be noted that the former are considerable, especially when non timber values are included. Indeed some studies have shown that conservation might be financially justified if such benefits could be commercially exploited[7].

1.13 In the light of the above arguments, it is clear that not enough would be done to conserve existing resources in the absence of government intervention, although it has to be recognized that some aspects of

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[7] See for example, C. Peters et al., [1989], "Valuation of an Amazonian Rainforest", Nature, 39: 655-656.

government policy, particularly in the field of fiscal policy can be as damaging to the environment in general and biodiversity in particular as anything else. A second point of importance is that, since issues are often global, the agreements of governments at an international level is necessary. Finally, the costs and benefits of actions are sufficiently unequal as to require a transfer of resources from the richer to the poorer countries of the world. The next section examines the major areas where such agreement have taken place and tries to estimate the amount of resources being transferred to Third World countries for the purposes of biodiversity conservation.

II. CURRENT SUPPORT FOR BIODIVERSITY CONSERVATION IN DEVELOPING COUNTRIES

2.1 Four types of action have been taken to support biodiversity conservation in developing countries:

(a) measures to protect particular habitat, such as wetlands, biosphere reserves etc;
(b) measures to protect particular species *in situ*;
(c) measures to conserve species *ex situ* - i.e. through captive breeding, gene banks etc; and
(d) measures to curb the contamination of the biosphere with pollutants.

2.2 In some cases these measures are organized through international conventions which, in turn, act through international development banks, through international organizations, through the efforts of the governments themselves, and through the participation of non-governmental organizations. In other cases these institutions and groups act without the benefit of a convention as such, but with specific conservation goals in mind. As far as conventions are concerned the major relevant ones to the problems of biodiversity in developing countries are shown in the box below. Excluded from this list are the many international agreements to limit biosphere pollution, such as the Montreal Protocol to Protect the Ozone Layer. Although such agreements have an impact on biodiversity, it is not the main aim of such conventions and their budgets are largely determined with other considerations in mind.

2.3 The activities of these conventions are largely organized by the contracting parties themselves, with the secretariats being concerned with the tasks of coordination, dissemination of information and, in some limited cases, research. For example, the RAMSAR convention, which is one of the most important in the field of habitat protection, relies on local resources to implement the protection of designated sites. Since many of

CONVENTIONS ON BIODIVERSITY RELEVANT TO DEVELOPING COUNTRIES

GLOBAL CONVENTIONS

1. Convention on Wetlands of International Importance Especially as Waterfowl Habitat (RAMSAR) 1971.
50 contracting parties. Secretariat in IUCN.

2. Convention Concerning the Protection of World Cultural and Natural Heritage (PARIS) 1972.
102 contracting parties. Secretariat part of UNESCO.

3. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (WASHINGTON) 1973.
96 contracting parties. Secretariat part on UNEP.

4. Convention on the Conservation of Migratory Species of Wild Animals (CMS) (BONN) 1979.
24 Contracting parties. Secretariat part of UNEP.

REGIONAL CONVENTIONS

1. African Convention on the Conservation of Nature and Natural Resources (ALGIERS) 1968.

2. Convention on the Conservation of Nature in the South Pacific (APIA) 1976.

3. ASEAN Agreement on the Conservation of Nature and Natural Resources (KUALA LUMPUR) 1985.

In addition there are a large number of Regional Seas Conventions, some of which are relevant to developing countries, and various agreements protecting species, classes etc. e.g. the International Whaling Commission.

these lie in developing countries with little in the way of funds to carry out the tasks, or to prevent encroachment on the sites, the extent of global conservation offered by the convention is greatly weakened. It also implies that the distribution of existing funds between sites is distorted in favour of those that are located in developed countries. For example, the United States and Canada have recently concluded a $1.5

billion Management Plan for North American Waterfowl. It would be surprising if even a fraction of that was spent in total on all wetland habitat protection in Africa.

2.4 Data on what is spent centrally under some of the conventions were not available, although all the relevant bodies were contacted. However, for the major ones the relevant figures are presented in Table 1. These show that the total allocation to central administration and coordination, research etc. for the four major international conventions is $6.3 million a year. This is a small sum by global standards but it covers, of course only a part of what is actually spent in conservation. Figures in the expenditures of the three regional conservation conventions have not been made available but are still being requested.

2.5 Information on what is being spent by the developing countries themselves in support of the conventions is very scarce. It could be collected on a comprehensive basis, but this would require a major research effort and more time than is available for the preparation of this report. Some figures were received from developing countries in response to requests by the author and UNEP, however, indicate that very small amounts are allocated to this area. For example, the government of Chile estimates, that current expenditures on biodiversity conservation are running at around $1.3 million annually. This is about one-sixth of what the government believes should be spent. The Commission of the South Pacific estimates that total spending in the 22 island countries under its mandate was about $500,000 in 1989.

2.6 Some idea of the amounts required for management and protection can also be gathered from occasional studies. In East Africa, for example, IUCN have reported that the annual resources available in the three countries of Kenya, Uganda and Tanzania for administration and protection of wildlife are respectively: $9.6 million (Kenya), $1.1 million (Tanzania) and $96,000 (Uganda). These are small amounts for the enormous tasks that these countries face in this area, particularly in Uganda and

TABLE 1

EXPENDITURES IN DEVELOPING COUNTRIES ON BIOLOGICAL DIVERSITY UNDER MAJOR CONVENTIONS

CONVENTION/ORGANIZATION	ANNUAL BUDGET	ITEMS COVERED AND GENERAL COMMENTS
CONVENTION CONCERNING THE CONSERVATION OF WORLD CULTURAL AND NATURAL HERITAGE	$2,000,000 in 1989	Contributions are through Man & the Biosphere as well as the World Heritage Convention. Very small part of total cost of each site is borne by UNESCO. About half of its exp. comes from its own budget, half from UNDP, UNEP etc.
CONVENTION ON WETLANDS OF INTERNATIONAL IMPORTANCE ESPECIALLY AS WATERFOWL (RAMSAR)	$750,000 in 1988	Expenditure throughout the world runs into "billions" of dollars but small % is spent in LDCs where most of the wetlands are found. Only 61 of 468 listed wetands are in LDCs.
CONVENTION ON THE CONSERVATION OF MIGRATORY SPECIES OF WILD ANIMALS (CMS)	$300,000 in 1989	Funding mainly from UNEP, but now also from parties to the Convention. Figures exclude direct conservation expenditures, which are undertaken by the countries themselves. Budget is mainly allocated to administrative support & coordination.
INTERNATIONAL WHALING COMMISSION	$1,120,000 in 1989	Contributions via contracting governments. Covers research, meetings & coordination.
CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES (CITES)	$3,300,000 in 1989	National government's undertake direct exp. on conservation management & protection. Expenditure by CITES is for research, monitoring, education, training & coordination.

n/a = not available Sources: direct communication with Parties concerned

Notes to Table 1:

The budget in each case refers to expenditures on biodiversity as far as possible.

The following other Conventions were contacted but did not reply:

(a) African Convention on the Conservation on Nature and Natural Resources
(b) Convention on the Conservation of Nature in the South Pacific
(c) Asean Agreement on the Conservation of Nature and Natural Resources

There are several specific agreements that have not been included because they are not directly relevant to developing countries, or because there were no data on them.

Tanzania. By contrast the estimated annual requirements are: $32 million (Kenya), $35 million (Tanzania) and $17 million (Uganda). It is also worth noting, and something that is discussed further later, that the income from the game parks themselves exceed the allocations to the wildlife departments themselves. For example, in Tanzania total earning from wildlife amount to $4.5 million whereas the budget for the department is $1.1 million.

2.7 In general, expenditures on conservation in developing countries are very small. In most of the government budget accounts they do not even rate a mention. Where there are sites that need to be managed, the allocations are generally inadequate. For example, in Nepal, six national parks, five wildlife reserves and one hunting reserve have been declared. In total these parks and reserves cover more than seven percent of the Nepal's land area. Under the National Parks and Wildlife Conservation Act of 1973 no hunting killing or capturing of any wild animal is permitted in the parks or protected areas. Nor is the cutting of trees, grazing or occupying of land permitted. But the capacity of the Department of National Parks and Wildlife Conservation to police the legislation is very limited and violations are frequent. This story is repeated many times in developing countries where intentions to conserve resources cannot be translated into effective action because of a lack of funds. Mobilizing sufficient resources for the purposes of conservation in countries that face severe government budget constraints is one of the key problems that any future convention on global biodiversity must resolve.

2.8 In contrast to the small expenditures on biodiversity conservation in developing countries, the amounts spent in developing countries are relatively large. The following countries furnished information on annual budgets devoted to biodiversity related issues within their countries: Denmark ($45 million, public), Finland ($57 million, public and $30 million private), Luxembourg ($7 million, public). Given the size of these countries, these amounts are very large compared to the allocations in developing countries where the global need is greatest.

2.9 In addition to the activities organized under conventions to protect the environment, a considerable amount is undertaken by national and international organizations. Details of the activities for which expenditure data are available are shown in Table 2. There are obvious gaps in this Table, and many of the figures are not directly comparable. Also there is some danger of double counting as, for example, UNDP expenditures show up in UNDP figures, as well as those of FAO. Nevertheless, after making allowance for such 'double counting' and taking the data as an indication of orders of magnitude, some interesting observations can be made:

(a) the Table shows that international organizations, for which data are fairly complete, spend about $75 million a year on biodiversity related projects. This excludes expenditures on items such as water and soil conservation, but includes, apart from biodiversity as such, plant genetic resources conservation and wildlife management. Even as a fraction of the spending of these institutions on environmental projects alone, this is an almost insignificant amount. The World Bank, for example, lent $2.2 billion in the Latin America and Caribbean region on environmental projects, but nothing on biodiversity as such. The UNDP environmental projects budget was $300 million in 1988. Of that 3%, or $9.4 million, went to biodiversity. The Inter American Development Bank spent nothing in this area and neither did the other major development banks, as far as can be ascertained;

(b) major international spending on biodiversity is undertaken by UN related organizations. In the latest year for which data are available, they spent $41.4 million on the conservation of tropical forest ecosystems. In addition the 9 centres operating under the Consultative Group on International Agricultural Research (CGIAR) and the International Board for Plant Genetic Resources (IPBGR) had a budget of $20-25 million. Finally the Forest Genetic Resources Programme and the Genetic Plant Materials Programme had allocations of under $1 million each;

TABLE 2

EXPENDITURES IN DEVELOPING COUNTRIES ON BIOLOGICAL DIVERSITY

BY NATIONAL GOVERNMENTS AND INTERNATIONAL ORGANIZATIONS

ORGANIZATION/COUNTRY	EXPENDITURE	COMMENTS
1/ US BASED EFFORTS ON BIOLOGICAL DIVERSITY	$37.5 million in 1987.	873 projects in 86 developing countries. Details by region, type of project & source of funding available. Local funds excluded. Also US contributions to multilaterals are excluded.
2/ UNDP ENVIRONMENTAL FUNDING	$9.4 million in 1988.	Total 'environmental' expenditures were around $300 million. Regional breakdown available. Items included in above were: biodiversity $1.593 million; plant resources conservation $5.165 million; wildlife management $2.625 million. This excludes general items such as forest & soil management and TA for environmental support some of which would help biodiversity.
3/ WORLD BANK ENVIRONMENTAL FUNDING	No direct allocation available	Large allocation to 'environment', eg. in Latin America & Carribean alone it was $2.2 billion in 1989. But none was for biodiversity as such. Some water & soil conservation exp. might be relevant. Also World Bank supported FAO Tropical Forestry Conservation - see below for details.
4/ INTER AMERICAN DEVELOPMENT BANK	nil	No identified expenditures on biodiversity as such. Some soil and water conservation might be relevant.
5/ ASIAN DEVELOPMENT BANK	No figures available	Information requested. Some alloaction to FAO is included under FAO Tropical Forestry Conservation.
6/ AFRICAN DEVELOPMENT BANK	No figures available	Information requested. Some alloaction to FAO is included under FAO Tropical Forestry Conservation.
7/ CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH (CGIAR)	$20-25 million in 1988/89	Runing plant genetic resource centers. Integrated Integrated conservation of wild relatives of crop species in situ. Budget comes from donors and UNEP. Covers 9 centers and IPBGR.
8/ FAO/UNEP/UNDP GENETIC PLANT MATERIALS PROGRAMME	< $1 million in 1989.	New international fund for plant genetic resources. Funding from governments and private sources.
9/ FAO/UNEP/UNDP FOREST GENETIC RESOURCES	$680,000 in 1985.	FAO programme with small support from IBPGR funds Danish Govt. and UNDP. Exp. is on seed procurement conservation (ex and in situ) and information.

TABLE 2

EXPENDITURES IN DEVELOPING COUNTRIES ON BIOLOGICAL DIVERSITY
BY NATIONAL GOVERNMENTS AND INTERNATIONAL ORGANIZATIONS

ORGANIZATION/COUNTRY	EXPENDITURE	COMMENTS
10/INTERNATIONAL ORGANIZATIONS VIA FAO CONSERVATION OF TROPICAL FOREST ECOSYSTEMS	$41.4 million in 1986.	Funding is as follows: $23 million country donors; $7.5 million development banks, of which World Bank was $7.2 million; and $11 million UN organizations.
11/INTERNATIONAL TROPICAL TIMBER ORGANIZATION (ITTO)	$200,000 in 1989	TA, approved field projects and consultancies. Voluntary contributions. Budget of $200,000 concerned with biodiversity is 5% of total.
12/COMMONWEALTH SECRETARIAT	$120,000 on average p.a. 1984-89	Conservation of plant resources, habitat protection and training in commonwealth countries.

Sources:

1/ "A Survey of US Based Efforts to Research and Conserve Biological Diversity", World Resources Institute, 1989.
2/ "Funding and Coordination of Environmental and Resource Management Projects by Major Donor Agencies and International Lending Institutions", R.M. Field UNEP, 1990.
3/ See 2/ above and World Bank Annual Report, 1989.
4/ See 2/ above.
5/ Annual Report, 1989.
6/ Annual Report, 1988.
7/ Annual Report, 1988 and Direct Communication
8/ "Commission on Plant Genetic Resources", Third Session, FAO, April 1990.
9/ "Sixth Session of the FAO Panel of Experts on Forest Gene Resources", FAO, December 1985.
10/ "Committee on Forest Development in the Tropics: International Cooperation in Tropical Forestry", Eighth Session, FAO, 1987.
11/ Personal Communication from ITTO, 1990.
12/ Personal Communication from Commonwealth Secretariat, 1990.

Notes: In addition FAO has estimated that its average annual expenditure on biodiversity conservation and use over the ten years 1980-89 has been about $28 million. Of this $3 million came from its regular programme and $24 million from extra bugetary resources (UNEP/UNDP etc.)

(c) the only country for which comprehensive data on spending on biodiversity are available is the United States. In a recent study, it was estimated that total spending, outside of US allocations to multilateral sources, on biodiversity in developing countries was $37.5 million in 1987. This is a large amount compared to the total spent by international organizations, and breaks down as shown in the box below. Although more than half of the total is spent by the government, NGOs and foundations are responsible for the other half. Over half of the total goes to the LAC region, with Costa Rica alone accounting for 15% of the total. Finally in terms of projects supported, research is the most important, followed by site/species management and education.

(d) detailed figures are not available for other countries but it is known that the Nordic group contributes significantly to aid in this area. For example, it has recently established a gene bank in South Asia which is worth $20 million over the next 20 years.

(e) a similar breakdown for the expenditures of the international organizations is available for biodiversity. UNDP environmental funding is concentrated more on Asia and the Pacific (32%) and Africa (25%). The FAO's tropical forest ecosystem conservation expenditures are supported by most OECD countries, with nearly half of the direct funding coming from the US. In overall terms, expenditure on tropical forestry by the FAO breaks down thus: Africa: 47%, Asia and the Pacific (33%) and Latin America and the Caribbean (13%). A further 6% is spent on global programmes. The IBPGR supports the collection of crop plant species, their evaluation, training and research throughout the world. The same applies to the Forest Gene Resources programme and the new International Fund for Plant Genetic Resources.

2.10 This section has shown that expenditure on biodiversity in developing countries is probably very low, both from domestic and external resources. The total allocation from external sources to these countries cannot be estimated, but the major contributors (the international

BIODIVERSITY SPENDING BY THE USA IN DEVELOPING COUNTRIES

By Source of Funding:
Govt.: 53% NGO:24% Other:23%

By Region(*):
Africa:12% Asia:16% LAC:60%

By Area:

Research	:44%	Site/Species Management:	23%
Education	:15%	Policy Planning :	6%
Institutional Support	:12%	Other :	1%

* 11% of funding is multiregional
LAC = Latin America & Caribbean

Source: World Resources Institute.

institutions and the US) between them account for around $112 million a year. Even if it is assumed that other OECD countries provide bilaterally an amount in proportion to their contribution of total bilateral aid, this figure would only rise to $191. To this can be added the expenditures of the Conventions' secretariats, which amount to $6 million for the four main conventions. All this is a small fraction of what is spent on conservation in developed nations and there are several reasons for thinking it is inadequate for the tasks faced by these countries. In the next section the main areas where additional funds are needed are analyzed, and an estimate made of the amounts that might be required to achieve the goals of biodiversity conservation that many have expressed, through the texts of the various conventions, as well as through more general statements on sustainable development.

III UNMET NEEDS FOR BIODIVERSITY CONSERVATION

3.1 In examining the unmet needs for biodiversity conservation, the following questions need to be addressed:

(a) what are the main categories in which current efforts are insufficient and to what extent are they insufficient;
(b) what are the best means of mobilizing the required additional resources, both domestic and international; and
(c) what role, does an international convention on global biodiversity have to play?

The first two of these are dealt with in this section. The third is examined in the final section.

3.2 As has been observed in the previous section, considerable efforts are already being made to protect the biodiversity of the planet. There are several conventions concerned with the issues; and the efforts of bilateral and multilateral donors and NGOs are not without substance. However, the strong conclusion from the review of existing efforts in this field is that: (a) it is not enough to cope with the magnitude of the problem, (b) developing countries, in which the bulk of the effort in biodiversity conservation should be made, are precisely the ones with the least resources to make the requisite efforts and, therefore, (c) financial mechanisms have to be put into place to mobilize more resources for these countries.

3.3 In a recent Report of the Ad Hoc Working Group of Experts on Biological Diversity[8], the following areas were identified as requiring further funding:

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[8] Report of the Ad Hoc Working Group on the Work of its Second Session in Preparation for a Legal Instrument on Biological Diversity of the Planet, UNEP/Bio.Div.2/3, February 1990.

(a) surveys, inventories and identification of biological diversity rich areas;
(b) development of technologies related to the conservation and sustainable use of biological diversity;
(c) technical assistance for research, training, education, public awareness etc;
(d) management strategies and plans for biological diversity rich areas, including recovery plans, coordination of various conservation activities and development of national conservation strategies;
(e) regular monitoring of the status of the world biological diversity;
(f) coordination of conservation strategies with policies for sustainable economic development;
(g) priority conservation projects; and
(h) transfer of technology.

In the remainder of this section, each of these areas is considered with regard to: why the current effort is inadequate, what kinds of action are required and how they might be funded.

Surveys, Inventories and Identification of Biological Diversity Rich Areas

3.4 As was noted earlier, the extent of our knowledge of the biodiversity of the planet is very incomplete, certainly less than 25% and perhaps only as much as 5%. Traditionally, inventory work has been carried out by a small group of highly skilled analysts and their labours have been painstaking, slow and expensive. According to one estimate, it would cost around $330 million just to survey 10% more of the plant and other species. It would cost ten times that to conduct complete habitat surveys and ten time that again to conduct complete genetic surveys. Such costs are prohibitive and unrealistic from both a physical and financial resource point of view. Moreover they do not allow for the trade-off between conservation and surveying. Presumably if species loss could be slowed down, the time period over which the surveying took place could be that much longer.

3.5 It is worth noting, however, that recent experience in Costa Rica has resulted in innovative approaches being adopted for this work. Local rural residents have been trained by scientists to collect and mount large numbers of hitherto unstudied insects and to key them at the macro level for subsequent systematic analysis. This kind of activity requires a mixture of local and foreign resources, and the total additional effort that is manageable could run into some millions of dollars. It has been argued, with some justification that the funding for this should come, in part, from those who benefit from the commercial development and use of biological products. In particular, a tax on the royalties from patented biological materials and a surcharge on tropical timber imports could be used to support survey and inventory work, as well as other activities related to site management, discussed in more detail below[9]. Combining the use of low cost survey methods, and some support from taxes of the kind described above could offer a start to meeting the financing need in this area. This could be further supported by funds from central governments, but the amounts of these would need further investigation.

Development of Technologies Related to the Conservation and Sustainable Use of Biological Diversity

3.6 The role of biotechnology is of importance in this regard. Biotechnology will lead to new and improved methods of conservation of genetic resources and accelerate the evaluation of germplasm collections for specific traits. It is argued therefore that there is a need to promote biotechnology that has the potential to benefit biological diversity and, more generally, that addresses more effectively the problems of sustainable development in developing countries. Fortunately there is again an appropriate source of funds for this purpose; namely the enterprises that profit from the commercial uses of biotechnology[10]. It

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[9] A tax of 3-5% on tropical timber imports has been proposed by the IUCN/WWF/UNEP "World Conservation Strategy for the 1990s", 1989.

[10] This is also an area where there is a need for a global convention (see below Section IV).

is not possible to estimate what amount should be transferred; that would depend on how successful such support programmes were and that is extremely difficult to gauge at this stage. However, it should be possible to start a programme initially with a relatively modest budget.

Technical Assistance for Research, Training, Education, Public Awareness

3.7 Training is undoubtedly one of the main areas where additional support is needed, primarily from external sources. Some of the activities have already been described above (see Section 3.4). In addition, those responsible for current programmes, such as the IPBGR, have repeatedly pointed to the need to expand the cadre of trained personnel in developing countries in the fields of conservation and biodiversity. For example, IPBGR have indicated that what is needed in their field is training for at least 300-400 individuals to MSc and PhD levels spread over 60 countries. Funding for this kind of activity can come in part from the resources raised by innovative methods such as taxes on the commercial development of biological diversity, but will probably need to be supplemented by direct funds for additional training. Furthermore the need in this area is urgent and cannot wait for the 'new' proposals to be put into force. Even the modest programme proposed by IPBGR would involve a cost around $10 million a year for the next 2-3 years. A more ambitious programme such as the one recently proposed by Mcneeley et al. indicates the need for 7500 more taxonomists. Training these over 10 years would cost around $22 million a year.

Management Strategies and Plans for Biological Diversity Rich Areas, Including Recovery Plans, Coordination of Various Conservation Activities and Development of National Conservation Strategies

3.8 This group covers a number of categories of expenditure. First there is need to increase funding for the management of protected areas and areas that need to be protected. Existing resources are inadequate for this purpose in most developing countries (see Section II above). However, more funds can be mobilized from exploiting the commercial values of these sites, many of which are of outstanding natural beauty and for

which visitors are willing to pay, and many of which have products that can be harvested on a sustainable basis. Already 'eco-tourism' revenues to some developing countries are substantial and these could be expanded by a combination of 'tourism taxes' and carefully managed growth in tourism itself[11]. Much of this will help conserve the resources in their own right, but the cause of biodiversity will benefit even more if some of the profits and tax revenues can actually be allocated to conservation. With tourism and related taxes this requires hypothecation, or earmarking, which in turn requires the agreement of the government concerned. Similar considerations apply to park fees, hunting permits etc.

3.9 External support for site management can also be provided through mechanisms such as debt for nature swaps. In these arrangements, the debt of a country is acquired at a substantial discount on the secondary market, by an NGO in a developed country, and the servicing obligations then paid into a fund that finances conservation programmes. So far five countries (Bolivia, Costa Rica, Ecuador, Madagascar and Philippines) have participated in debt for nature swaps, reducing their external debt by about $100 million. This makes little impact on the total indebtedness but a big one on the conservation budget. For such swaps to play a bigger role, the debtor governments need to be willing to accept them more readily, and competent local NGOs need to be formed, to manage the endowment and conservation programmes. In some cases, however, there is an identified need for the sites to be internationally managed without recourse to any swaps. In such cases additional funds may be required from external sources.

3.10 The other two activities under this category require different forms of support. Coordination is essentially the activity of an international body, probably under the aegis of a convention, and is discussed in the next section. The formation of National Conservation Strategies is

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[11] See, for example, J. Gradwohl and R. Greenberg, [1988], Saving the Tropical Forests, Earthscan, London.

already taking place under the direction of the IUCN and this work could be expanded. Funding would have to come from the usual sources: foundations, NGOs and bilateral aid agencies.

Regular Monitoring of the Status of the World Biological Diversity

3.11 This is an important activity that needs to be undertaken, bringing together what is already being done, particularly by bodies such as IUCN, and commissioning studies to fill the gaps as necessary. It would be appropriate for it to be undertaken by an international body responsible for biological diversity. An annual budget for such activity would probably need to be in the region of $2 million. This would permit a certain amount of primary data collection and the synthesis of what is already collected.

Coordination of Conservation Strategies with Policies for Sustainable Economic Development

3.12 It is important to emphasize that conservation is not a goal in its own right, but an objective with the purpose of improving living standards throughout the world and particularly in developing countries. Furthermore, the task of conservation is rendered much easier if those who have access to the resources also have an incentive in conserving them, if those responsible for managing national budgets do not see conservation as a drain on their limited funds, and if government policies themselves are not designed to destroy biodiversity through perverse inducements. Usually, though not always, these incentives are economic. The task that is being faced, is to indicate how such policies and incentives might be structured, and to help developing countries in implementing them. To some extent that is what the National Conservation Strategies set out to do with the help of IUCN. However, one of their weaknesses has been the relative neglect of the 'economic dimension'. To strengthen this would require linking the conservation strategies to the macroeconomic plans of the country. Technical assistance in this area would be of great benefit and could be provided through UNDP.

Priority Conservation Projects

3.13 Priority conservation projects are an important area for future funding. There are some sites and species where, unless emergency action is taken, habitats are threatened and extinction is a real possibility. One of the tasks of any putative organisation dealing with biodiversity would be to identify those areas and species which could draw on a special fund. Such a facility has been identified as being important in the various discussions of the Working Groups, and others. It is facility that would have to be operated through one of the existing institutions dealing with biodiversity, but under the control of the members of nay organization responsible for the overall global convention on biodiversity. The sums involved in its efforts are hard to quantify at this stage. Much the best policy would be to start with a small allocation and see how successfully it was used up.

Transfer of Technology

3.14 Finally there is the transfer of technology. New methods of conservation, and products developed through biotechnology can help the process of conservation. Those undertaking the development would have to be compensated if they were to give access to their technology to the developing countries. This would require funds from a central source. At the same time, the benefits of the commercial exploitation of products should be more equitably shared between those concerned with research and development, the plant breeders and the owners of genetic resources. The FAO Commission on Plant Genetic Resources addresses some of these issues. Another possibility is to give suppliers of genetic resources preferential treatment to the products obtained from gene banks established with international funds.

3.15 To date no proper appraisal of the items that might be transferred, and the costs involved, has been undertaken. Such an evaluation must be a precursor to any comprehensive programme of technology transfer. At this stage it is not possible to say how large the fund would be, or what kinds of items it would deal with.

IV A CONVENTION FOR BIODIVERSITY

4.1 In this final section the reasons for a new convention on biodiversity are examined and the issue of what its terms of reference should be is addressed. First there is a need for a global strategy on biodiversity, covering all aspects of the problem, and identifying priorities in certain areas and in certain fields. That can only be achieved through an international agreement.

4.2 Second, although existing conventions cover many conservation issues, there are still gaps that need to be filled, two of which stand out. First, present conventions address specific issues but not the whole area of biodiversity as such. Hence there is no facility for monitoring and evaluating the progress, or lack of, that is taking place in this domain. Second, and most importantly, they do not concern themselves with the transfer of resources and support for biodiversity conservation in developing countries. Some link between the stated objectives of conservation and the commitment of parties to support conservation in a global context is required.

4.3 It is essential, of course, that any new convention take account of the existing conventions and the activities that they support and not duplicate them. The treaty needs to ensure:

(a) that the benefits of biodiversity protection are reflected in the policies of the member countries that impinge on biodiversity;
(b) that it involves itself with issues of international transfers of revenues from taxes on products derived from the commercial development of biodiversity in developed countries. The framework within which such taxes would be levied would be a matter of concern for the convention;
(c) finally it needs to act as a facilitator for the private sector in developed countries to transfer its technology to the relevant institutions and individuals in the developing countries.

4.4 One question addressed at the beginning of this report was to do with the size of the fund required to achieve the unmet conservation needs of developing countries. One estimate provided by the World resources Institute refers to the unmet needs of conservation being of the order of $2-5 billion per annum over the next decade. Such a figure is not of much use in the context of this exercise, because it does not identify which expenditures are covered, how much can be raised from domestic sources, including new ones, and how much can be left to the private sector. What is more important than an overall 'figure' (which is of interest in its own right) is an identification of the sources and uses of the various resources. This report has tried to carry out that task. A number of features stand out in this regard. Many of the required resources do not need to be raised from a central fund, but to be mobilised from a more effective commercial (but sustainable) exploitation of the habitats and species in the developing countries. This includes tourism, use of forest products, and wildlife. However, additional resources will be needed from a central fund, to which member countries should subscribe on concessional terms. This would be channeled through existing institutions such as FAO, UNEP, UNDP and the Development Banks and would cover: support for training, priority management of sites and species, transfer of technology in appropriate areas and monitoring of global changes in biodiversity. From the analysis in this report it would seem that such a fund is more likely to be 'supply constrained' rather than constrained by the demands for further work in this area. Limiting factors will be: the capacity of developing countries to undertake and organise the relevant work, and the perceived benefits of individual parts of the programme to those who stand to gain from it in a direct way. In the light of these considerations, it is unlikely that the fund could be very large; certainly not in the first instance of the order of billions of dollars as stated in the recent World Resources Institute report.

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